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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/073,223	02/13/2002	Tsunehiro Nishi	KOJIM-446	4806

23599 7590 10/07/2003

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EXAMINER

LEE, SIN J

ART UNIT	PAPER NUMBER
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1752

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DATE MAILED: 10/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/073,223

Applicant(s)

NISHI ET AL.

Examiner

Sin J Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 February 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated by Nozaki et al (5,968,713).

In Example 86, Nozaki makes a copolymer of 2-methyl-2-adamantyl methacrylate and vinyl acetate (see the chemical structure in col.79, lines 10-20) which has the Mw of 8,200. The 2-methyl-2-adamantyl methacrylate unit teaches present repeat unit "d" (i.e., the last repeating unit of the formula (1)): present R^{16} would be a hydrogen atom; present R^{15} would be a methyl group; and present R^{21} would be 2-methyl-2-adamantyl group (which is present acid labile group of claim 1 and present acid labile group of claim 2 which is a tertiary alkyl group having a cyclic structure). Besides, Nozaki's 2-methyl-2-adamantyl methacrylate unit is also listed in the present specification (pg.20) as one of the examples for the present repeat unit "d". The vinyl acetate unit teaches present repeat unit "x1" (i.e, the first repeating unit of the formula (1)): present R^1 , R^2 , and R^4 would all be hydrogen atoms and present R^3 would be a monovalent hydrocarbon group of 2 carbon atoms which may contain a hetero atom. Besides, Nozaki's vinyl acetate unit is also listed in the present specification (pg.14) as

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one of the examples for the present repeat unit "x1". Since "x2", "x3", "a", "b", and "c" can all be zeros in present claim 1, *Nozaki's copolymer in Example 86 teaches present polymers of claims 1 and 2*. Also, Nozaki's copolymer satisfies present equation $x1 + x2 + x3 + a + b + c + d = 1$.

In Example 71, Nozaki makes a copolymer of 2-methyl-2-adamantyl methacrylate and vinylcarbonate (see the chemical structure in col.73, lines 18-27) which has the Mw of 9,300. As explained above, the 2-methyl-2-adamantyl methacrylate unit teaches present repeat unit "d". Nozaki's vinylcarbonate unit is also listed in present specification (pg.14) as one of the examples for the present repeat unit "x1". Therefore, Nozaki's vinylcarbonate unit teaches present repeat unit "x1". Since "x2", "x3", "a", "b", and "c" can all be zeros in present claim 1, *Nozaki's copolymer in Example 71 teaches present polymers of claims 1 and 2*. Also, Nozaki's copolymer satisfies present equation $x1 + x2 + x3 + a + b + c + d = 1$.

In Examples 87 and 72, Nozaki combines the copolymer of Examples 86 and 71 respectively with a photoacid generator to make a resist solution. The resist solution is spin-coated onto a silicon substrate and prefaced at 120°C for 60 seconds to form a resist coating. The resist coating is then selectively exposed to a pattern of laser light having a wavelength of 193 nm or 248 nm. The exposed resist coating is then subjected to the post exposure baking at 150°C for 60 seconds, and the post baked resist coating is developed with an aqueous solution of 2.38 wt% of TMAH for 60 seconds to form a positive resist patterns. Therefore, Nozaki's Examples 87 and 72 teach present inventions of claims 1-4.

Also, Nozaki's copolymer (*Mw* of 16,000) made in Example 44 (see the chemical structure in col.62, lines 35-45) teaches present polymer of claim 1. The first repeating unit of Nozaki's copolymer teaches present repeat unit "x3": present R^9 and R^{14} would both be hydrogen atoms; present R^{10} would be a methyl group; present R^{13} would be a cyclic monovalent hydrocarbon group of 6 carbon atoms, present R^{12} would be a hydrogen atom, and present R^{11} would be a cyclic, monovalent hydrocarbon group of 6 carbon atoms which contains a hetero atom (oxygen atom). The second repeating unit of Nozaki's copolymer teaches present repeat unit "d": present $R^{16''}$ would be a hydrogen atom; present $R^{15''}$ would be a methyl group; and present R^{21} would be a t-butyl group which is an acid labile group of present claim 1. Since "x1", "x2", "a", "b", and "c" can all be zeros in present claim 1, Nozaki's copolymer in Example 44 teaches present polymer of claim 1. Also, Nozaki's copolymer satisfies present equation $x1 + x2 + x3 + a + b + c + d = 1$. Nozaki combines the copolymer of Example 44 with a photoacid generator to form a resist solution. The resist solution is spin-coated onto a silicon substrate and then pre-baked at 100°C for 60 seconds to form a resist coating. The resist coating is then imagewise exposed to a laser light of wavelength of 193 nm. The exposed resist coating is then subjected to the post-exposure baking at 150°C for 60 seconds. The postbaked resist coating is developed with an alkaline developer for 60 seconds to form positive resist patterns. Therefore, Nozaki's Example 44 teaches present inventions of claims 1, 3, and 4.

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sin J. Lee whose telephone number is (703) 305-0504.

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The examiner can normally be reached on Monday-Friday from 8:30 am EST to 5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ms. Janet Baxter, can be reached on (703) 308-2303. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9311 for after final responses or (703) 872-9310 for before final responses.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-0661.

S. J. L.

S. Lee
9/15/03



JANET BAXTER
SUPERVISORY PATENT EXAMINER
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